

Publication Draft-Performance Specification
SOPMOD Enhanced Grenade Launcher Module (EGLM)
8 June 2001

1. Scope: This draft document establishes the preliminary performance requirements for the 40mm Enhanced Grenade Launcher Module (EGLM). This document is not the final specification for the EGLM, rather represents the current operational and technical vision of an EGLM that will meet future operational requirements.

The specification is derived from formal market surveys. It does not represent any current commercial system in particular; rather the specification is a hybrid of performance features that government operational and technical personnel consider the optimum combination for a successful acquisition of a new combat capability.

Where a performance range, rather than exact parameter, is appropriate, the requirement is shown for Threshold (T), or lowest acceptable standard, and Objective (O) the highest standard that may be technically affordable.

This draft is published for industrial, academic, and government comment. Comments obtained from this public interaction will help define the final specification, which will be included in the future solicitation. Potential offerors, academia, and government may suggest additional capabilities and/or proposed test protocols, or entirely new and innovative concepts that will meet the requirements.

The specification pre-supposes the availability of testing and operational 40mm Low Velocity ammunition with an accuracy standard of plus or minus 1 mil in both range and deflection probable error.

This specification is closely interrelated with a tandem specification for Platform Modifications (PMOD) to M16/M4-series rifles and carbines. The reason that the specifications are separated is to establish a baseline set of host rifles and carbines in PMOD configuration, and to achieve other immediate rifle and carbine objectives, by the year 2002, then to allow follow-on testing of candidate EGLM systems on PMOD baseline rifles and carbines for initial EGLM procurement in 2004.

2. Documents and References

2.1 Government Documents

2.1.1 Specifications and Standards: The following specifications and standards form a part of this Performance Specification and will be used for guidance or to the extent specified herein. Unless otherwise specified, the issues of these documents shall be those listed in the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation.

Specifications, Military:

MIL-W-13855	General Specification for Weapons, Small Arms and Aircraft Armament Subsystems
-------------	--

MIL-C-53072 Chemical Agent Resistant Coating
 (CARC) System Application Procedures and Quality
 Control Inspection

Standards, Military:

MIL-STD-461 Requirements for the Control of Electromagnetic
 Interference Characteristics of Subsystems and
 Equipment

MIL-STD-810E Environmental Test Methods and Engineering Guidelines

MIL-STD-1913 Dimensioning of Accessory Mounting Rail For Small
 Arms Weapons

MIL-STD-1916 DOD Preferred Methods for Acceptance of Product

MIL-STD-961 Department of Defense Standard Practice for
 Defense Specification

MIL-STD-105 Sampling Procedures for Inspection by
 Attributes.

MIL-STD-109 Quality Assurance Terms and Definitions

MIL-STD-781 Reliability Tests: Exponential Distribution.

MIL-HBK-454 [\[Title\]](#)

NAVSEA SW010-AD-GTP-010 Small Arms and Special Warfare Ammunition

ITOP 4-2-602 Rough Handling Tests

MILSTD 1367A Packaging, Handling, and Storage Transportability
Program Requirements for Systems and Equipment

TOP [\[Title\] Grenade Launchers](#)

Guidance for Approval and Use of Army Power Supplies

2.1.2 Ballistic Tables: The following ballistic tables are referenced for use in development of ballistic solutions for the EGLM Fire Control: US ARDEC Ballistic Table, M203 Ballistics (Author Mr. Darren Ward) created 26 May 1998.

2.1.3 Operational Test References:

An independent Operational Test and Evaluation (OT&E) activity will develop a test plan containing measurable operational criteria, normally using STRAC Manual Chapter 5, Infantry Weapons Systems, and always using applicable OT&E laws, regulations, and guidance. Effectiveness and Ease of Use

User-developed requirements and performance specifications will be finalized during the research process. These are the dominating documents for development of operational criteria:

DoD 5000.2-R, Interim Regulation, Mandatory Procedures for Major Defense Acquisition Programs 1 January 2001.

(Provides general overarching guidance on the conduct of OT&E)

STRAC Manual, Chapter 5, Infantry Weapons Systems

(Provides a procedural scoring baseline for weapons performance, and may be used as the basis of a tailored OT&E live-fire scoring procedure.)

FM 23-31, M203 Grenade Launcher

Army Regulation 71-3, Test and Evaluation

(Contains regulatory guidance for the planning, administration, and execution of OT&E.)

Special Operations Forces Missions Design Considerations, 11-98

(Provides a narrative of typical SOF mission scenarios to aid in OT&E event planning)

2.2 Order of Precedence: In the event of a conflict between the text of this document and the references cited, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

Copies of military specifications and standards are available from: Standardization Document Order Desk, 700 Robbins Ave., Bldg #4, Section D, Philadelphia, PA 1911-5094.)

3 EGLM System Requirements

3.1 Item Definition: The EGLM shall be a lightweight, single-shot, breech loading, swiveling barrel, shoulder-fired weapon attached to the M16/M4-series rifles and carbines. EGLM shall provide an increase in operational capability over the present M203 currently in use. This capability shall include: 1) The ability to achieve first-round (O) second-round (T) effect on targets, with certified-capable ammunition, both day and night; 2) Will not interfere with host rifle/carbine barrel harmonics. 3) Will accept longer (up to 137mm) 40MM Low Velocity cartridges. 4) A capability for simple conversion to a stand-alone system 5) EGLM shall be easy to operate; it shall be reliable and durable in an operational environment and shall require minimum operator maintenance. 6) EGLM shall be an ambidextrous weapon with intuitive aiming and weapon controls.

Note: The EGLM is a project acceleration of a SOPMOD III initiative, originally programmed for fielding in 2008. It was accelerated due to un-requested congressional plus up of FY01 RDT&E funds. TASK: SOPMOD PMO will undertake research, development, testing, and evaluation actions to support the objective requirement of fielding of a quick attach/detach enhanced 40mm grenade launcher module that fires the current inventory of U.S. and NATO 40mm ammunition and a new generation of enhanced, non-developmental munitions. The objective 40mm grenade launcher system should include enhanced operational features (including enhanced ejections, ambidextrous loading/firing, stand-alone

capability). Dependent on available technology and continued congressional intent to accelerate the project, it shall include an integrated sight capable of ballistic solution that shall automatically display an adjusted aim-point. Additionally, as resources and technologies permit, enhanced 40mm munitions (including more lethal air-burst HE/HEDP, low cost airburst training, improved IR illumination rounds, IR day/night markers, surveillance and less than lethal technologies) are desired to support both the current M203 and the objective 40mm grenade launcher module.

3.1.1 Missions: Joint Special Operations Forces (SOF) requires versatile weapons to cover defensive and offensive operations in SOF mission scenarios. These missions include Counter-terrorism (CT), Counter-narcotics (CN), Special Reconnaissance (SR), Strike Operations (SO), and Foreign Internal Defense (FID). These missions often place operators in diverse operational situations and roles including Military Operations in Urban Terrain (MOUT) and Close Quarters Combat (CQB), as well as long-distance standoff situations. To accomplish these missions, SOF require weapons that improve hit probability and lethality at longer ranges as well as CQB. The EGLM shall be a man portable, shoulder fired weapon used primarily to incapacitate or suppress enemy personnel and lightly armored targets. EGLM will be tailored to these SOF mission scenarios and will provide operators with a first round hit capability (O). This tailoring will increase the weapon's lethality through fire control and target acquisition day and night both during CQB and to ranges of 400 meters or more.

3.1.2 System Characteristics (States and Modes of Use): SOF shall fire the EGLM in the standing, kneeling, sitting, and prone positions, both supported and unsupported. SOF shall utilize the EGLM in extreme environments including desert, arctic, jungle, marine, and high altitude, in weather extremes to include rain, hail, snow, and dust storms. SOF shall fire the EGLM in the surf zone while prone, exposing the weapon to flooding and re-flooding with saltwater/sand slurry from incoming waves. The system must withstand exposure to extreme conditions up to and including extended periods in a surf zone, immersion at a depth of 66 feet, temperatures from -45 degrees Celsius to +71 degrees Celsius, and corrosive environments including salt fog and humidity. States and Modes of Use will be used to develop both developmental and operational test events.

3.1.2.1 Transport and Storage: The system shall withstand transport and storage according to MILSTD 1367A Packaging, Handling, and Storage Transportability Program Requirements for Systems and Equipment. The EGLM, must also survive immersion in salt water to a depth of 66 feet (T), 200 feet (O) for 2 hours. Operators will also parachute with the EGLM from aircraft. The system must withstand transportation at 35,000 feet altitude for 2 hours.

3.4 Key Performance Parameters: Key performance parameters are must-pass testing events. Any offering failing any of the KPP's will be removed from further testing and will not be further tested or considered for contract award.

3.4.1 KPP 1, Mounting method: EGLM shall be mounted for use on the M16/M4-series rifles and carbines using a 6:00 MILSPEC 1913 rail or other interface to be published as a Level 3 Drawing or Interface

Control Document (ICD). See related specification for SOPMOD PMOD. EGLM shall not contact the barrel of the host rifle/carbine, nor interfere with barrel harmonics, when mounted. EGLM must be capable of being fired as a stand-alone module, without a host rifle/carbine.

Rationale: (1) Contact with the rifle/carbine barrel adversely affects rifle performance and promotes conductive heat transfer to the operator's hand and to electronic modules mounted in the forearm area. (2) SOF operators have insisted that on certain missions, the EGLM must be capable of conversion to a stand-alone weapon without need for a host rifle/carbine.

3.4.2 KPP 2, Interoperability (1): EGLM shall safely fire the following ammunition types (DODIC in parentheses): 40mm HEDP M433 (B546), HE M406 (B568), HE M397 (B569), Practice M407A1 (B577), Red Star Parachute M662 (B505), Green Star Parachute M661 (B504), White Star Cluster M585 (B536), White Star Parachute M583A1 (B535). The results of actual special operations scenarios during OT&E shall be included in compatibility/interoperability evaluation.

3.4.3 KPP 3, Form and Function: EGLM shall be single shot, manual feed, breech loaded.

3.4.4 KPP 4, Trigger and Cocking Mechanism: EGLM shall incorporate a trigger that allows both accurate firing and the ability to re-strike without opening the breech, under conditions of extreme fouling or other interference with the firing pin. EGLM shall have a trigger-cocked action, analogous to "Double Action Only" pistols (O), or will have other means of re-cocking that does not require opening the breech (T). Trigger pull shall be not less than 6 lbs and not more than 12 lbs.

Rationale: A shortcoming of the currently fielded M203 is that the operator must open the breech to re-cock the hammer. Re-cocking is often required in the salt/sand environment of Over The Beach (OTB) combat, due to sand infiltrating the M203 Grenade Launcher mechanism. Also, re-cocking is required (in combat only) in the event of a misfire. This, in the M203, allows the round to fall from the breech, creating a possible safety hazard and operational hindrance to the operator.

3.4.5 KPP 5, Breech: Loading and extracting of the EGLM shall be accomplished by the barrel swinging in a horizontal plane (T). It shall be designed so that unit-level maintenance personnel may switch the operation of the barrel from a left swing to a right swing (O). The swing of the barrel shall open as far as needed to allow the use of 40mm rounds measuring up to 137mm in length, and shall not impede any operations of the host rifle/carbine (T). The barrel shall not swivel more than 45 degrees relative to the centerline (barrel in the closed position)(O).

Rationale: Swinging breech will allow firing of currently fielded and developmental longer 40mm rounds. Also, this improves ergonomics and enhances firing from the prone position behind cover.

3.4.6 KPP 6, Sighting System: EGLM will incorporate an optical sighting system that will provide a range to target (T) and/or

ballistic solution (O) to the shooter during day and night. This sighting system must zero the EGLM when mounted on the rifle/carbine and as a stand-alone module. If the EGLM sighting system incorporates a laser, the laser shall be classified and labeled by the manufacturer in accordance with CFR Title 21, Part 1040.10 or using MIL-STD-1425A as guidance. This device shall present no new health or safety (electrical, optical or other) hazard to the user and/or bystander. POSSIBLE SPECIFICATION: The EGLM sighting system shall have an anti-cant indicator visible to the operator during both day and night operations. This indicator is required to ensure the weapon is properly oriented for maximum accuracy. The cant indicator will be capable of being seen with the naked adapted human eye or with night vision goggles as listed below. The results of actual special operations scenarios during OT&E shall be included in cant indicator testing evaluation. The OT&E shall evaluate the anti-cant indicator in terms of ease of use, speed and accuracy of target engagement.

Rationale: An operational shortcoming of the currently fielded M203 is its lack of a precision optical sighting system. Iron sights with a short radius also adversely affect the accuracy of the system. Also, as a note, the specification of a cant indicator is to help achieve first round hit capability in a weapon that is very sensitive to cant. It may be possible to achieve this objective with a self-adjusting sighting system that automatically takes cant into account. Other parameters affecting accuracy, such as target elevation, might also be incorporated into such a system.

3.4.7 KPP 7, Safety: Firing of the EGLM shall not pose a safety hazard to the operator during handling, transportation, storage and use. This parameter may be tested in both a Developmental Test (DT) and an Operational Test (OT) environment.

3.5 Cost as an Independent Variable (CAIV): CAIV shall be used to manage the cost of acquiring the EGLM, and to obtain a "Best Value acquisition. CAIV is treated as an independent specification. Current estimates from market survey indicate that the maximum Procurement Average Unit Cost (PAUC) of the EGLM, with accessories, will be approximately \$4,500.00 each, (T) and the minimum PAUC will be approximately \$3,000 (O).

In the CAIV process, offerors have the latitude to propose any enhancements, which they believe, provide benefit to the Government. In order of priority, the desired enhancements are as follows:

1. Greater Accuracy
2. Increased Ease of Use or Speed of Target Engagement
3. Greater Reliability and Endurance
4. Reduced Weight
5. Reduced Power requirements
6. Longer Warranty Coverage

Offerors pricing tables will be used for CAIV evaluation. Depot-level assembly/disassembly times/labor/special tools cost will be scored as part of CAIV and life cycle cost analysis. Additionally, during the testing process, a preliminary Life Cycle Cost Estimate (LCCE) will be developed using failure information derived from testing and other logistics considerations. These will be combined with other pertinent

pricing data (such as cost-effectiveness) to develop a recommendation to the Source Selection Authority (SSA).

3.6 Additional Performance Parameters (APP): APP's are scored testing events. APPs are tradable parameters that are used to measure effectiveness and performance. Failure to meet the requirement specified in an APP does not remove a submission from further testing or from consideration for contract award. APP's are evaluated to provide a best value determination.

3.6.1 General APP Requirements:

3.6.1.1 APP 1, Weight: EGLM weight (less butt stock and other accessories, if any) shall not exceed 2.5lbs (O), and shall not exceed 3.5lbs (T).

3.6.1.2 APP 2, Mechanical Safety Mechanism: EGLM shall incorporate a manual safety lever, with two (2) detented positions. It will have a high friction surface of knurled, stippled, checkered or other texture. It shall be ambidextrous so that safety lever may be functioned by the thumb of both right and left-handed shooters. The mechanical safety shall have corresponding "S" marked in an indelible white color and an "F" letter indelibly marked in red, for the safe and fire positions respectively. The operator must be able to view these markings from both sides of the weapon. In addition to the indelible surface markings, the EGLM shall contain engraved, etched or stamped markings on the weapon housing that allow tactile determination of the safety status of the weapon.

Rationale: Operator Safety.

3.6.1.3 APP 3, Extraction/Ejection: The EGLM shall forcefully eject spent cartridge casings under extreme operating and environmental conditions, and retain unexpended (live) cartridges, when breech is opened. EGLM shall incorporate two opposing semi-circular cut outs that allow manual extraction of the spent cartridge, as an emergency extraction feature should mechanical extraction fail.

Rationale: Operator Safety.

3.6.1.4 APP 4, Barrel Ergonomics: EGLM barrel length shall not be greater than 9 inches +/- .1 in length. It is desired that the EGLM barrel length shall be as short as possible without degrading range, accuracy, or operational performance of the grenade launcher or ammunition. It shall have a shield to protect the shooter's hand. The hand guard/heat shield will have a high friction surface of knurled, stippled, checkered or other texture. The hand guard/heat shield will be made of lightweight, heat resistant, durable polymer or composite and will be bonded or otherwise affixed to the barrel. Barrel: One version of the barrel will have a MIL-STD 1913 rail molded on to or integral to the outside of the barrel at the 6:00 position; the second version will be a standard barrel without a MIL-STD1913 rail.

Rationale: Ergonomics. The SOPMOD Program Office has preliminary test information which indicates that the barrel may be shortened to as short as 7.5 inches without degrading performance with most 40mm

munitions. However, offerors should conduct their own testing to determine optimal barrel length.

3.6.1.5 APP 5, Breech Lock: The EGLM shall incorporate a Breech Lock that will not allow inadvertent opening of the breech under extreme operational conditions. The Breech Lock Release shall be located forward of the trigger within the trigger housing. It shall be ambidextrous for left and right-handed shooters to operate with their index finger.

Rationale: A shortcoming of the currently fielded M203 system is that the position of the breech lock release lever allows frequent, inadvertent opening of the breech, when the operator carries the weapon in the patrol carry position.

3.6.1.6 APP 6, Breech Opening Function: Breech opening shall be spring assisted, so that the breech springs open unassisted by the operator when the breech lock release is depressed.

Rationale: This feature will increase operators' rate of fire.

3.6.1.7 APP 7, Pistol Grip: The EGLM shall incorporate a pistol grip attached to the receiver of the EGLM. The pistol grip will have a high friction surface of knurled, stippled, checkered or other texture. The pistol grip shall in no way interfere with magazine changes of the M16/M4-series rifles and carbines. Distance between the magazine of the host M16/M4-series rifles and carbines and the pistol grip of the EGLM will be sufficient to allow for positive control of the pistol grip.

Rationale: Weapon controllability and ergonomics.

3.6.1.8 APP 8, Stand Alone Module: The EGLM shall provide a stand-alone, modular buttstock for use when not mounted on the M16/M4-series rifles and carbines. The rear surface of the butt stock will extend to a maximum extension distance of 10-3/4" from the web of the pistol grip. It will have 3 additional intermediate positions at 10", 9-1/4", and 7-1/2", all measured from the web of the pistol grip.

Rationale: Operational Suitability.

3.6.1.9 APP 9, Iron Sight: The EGLM shall incorporate a backup iron sight system for emergency use. This sight shall not create a snag hazard and shall allow the operator to fold the sight to a protected position when not in use. The EGLM shall have retractable or low profile non-powered or tritium powered iron sights. The iron sights shall be self-protecting and reduce snag hazard. This sight must be capable of being used in the event the day sight and/or IR active sights fail. The iron sights will be adjustable for windage and elevation. The results of actual special operations scenarios during OT&E shall be included in iron sight testing evaluation.

3.6.1.10 APP 10, Ease of Use: The EGLM shall be quickly, effectively, and easily employed by the operator while wearing standard battle dress uniform, and while wearing the full range of standard environmental protective clothing, including MOPP 4 and cold weather

protective clothing (excluding arctic mittens). The results of actual special operations scenarios during OT&E shall be included in effectiveness and ease-of-use testing evaluation.

Considerations for the effectiveness, ease of use and non-complexity of operation may include, but not be limited to, the following:

- Scores and times in the negotiation of operational live-fire tests
- Ease of mounting the EGLM to the weapon
- Ease of achieving boresight and/or zero
- Ease of setting the range to the target
- Ability to aim and fire the weapon at all ranges
- Ability to understand the operation of the EGLM
- Ease of removal from weapon

Rationale: Operator Lethality and Survivability.

3.6.1.11 APP 11, Interoperability (2): The EGLM, when mounted on the rifle/carbine will not interfere with changing of the magazine, iron sights, eye-sight alignment (operator/rifle/carbine). The EGLM shall not interfere with the use of the following fire control items mounted on the rifle/carbine: 1) Backup Iron Sights (BIS). 2) Infrared Target Pointer/Illuminator/Aiming Laser (AN/PEQ-2). 3) Infrared Aiming Light (AN/PAQ-4C). 4) Carbine Visible Laser (AN/PEQ-5). 5) Close Combat Optic (Army M68 CCOS). 6) Reflex Sight. 7) Visible Light Illuminator (VLI). Offerors may view the items listed in this paragraph (except munitions) at Crane by scheduling an appointment on a mutually agreeable date through the contracting office.

3.6.1.12 APP 12, Exterior Finish: The EGLM shall have a dull, non-reflective medium gray or taupe exterior finish.

3.6.1.13 APP 13, Mounting: Tools shall not be required to install or remove the EGLM from the weapon, or to install or remove the EGLM stand-alone module buttstock. EGLM shall allow installation and removal during periods of limited visibility.

Rationale: Operational Suitability - Tools are not readily available or portable in an operational environment.

3.6.1.14 APP 14, Marking: All adjustments must be labeled. If the EGLM sighting system incorporates a laser, the Laser shall have identification/power level markings in accordance with U.S. Regulatory Agency requirements.

Rationale: Operational Suitability and Operator Safety.

3.6.1.15 APP 15, Workmanship: Workmanship shall be in accordance with ANSI IPC J-STD-001A.

3.6.2 Operational APP Requirements:

3.6.2.1 OPN APP 1, Mean Time to Failure: The EGLM optical system shall have a Mean-Time-To-Failure (MTTF) of 10,000 hours and

10,000 cycles, where a cycle is defined as 10 seconds ON, 2 seconds OFF.

Rationale: Modified CECOM specification.

3.6.2.2 OPN APP 2, Reliability: The system shall demonstrate a minimum acceptable Mean Rounds Between Failure of at least 1500 (threshold) and 4000 (objective). A Failure shall be defined as any one or more of the following: (1) The occurrence of a malfunction that cannot be cleared in 10 seconds. A malfunction is any cessation of any ability of the system or any of its components to perform its intended function. A system is the item or combination of items, which are under test. (2) The occurrence of a launcher condition, which causes an unwarranted safety hazard to personnel. (3) The occurrence of broken or unserviceable part, which renders the launcher inoperable or unsafe, if firing is continued. Failures which are attributable to ammunition or operator shall not be charged against the launcher; they will however, be recorded.

Rationale: Modified M203 Specification (MIL-L-45935A)

3.6.2.3 OPN APP 3, Controls: All EGLM controls shall be capable of being adjusted without special tools, throughout their full ranges, while wearing Mission Oriented Protective Posture (MOPP) Chemical Protective Gloves. To facilitate operational use in extreme cold weather environments, the EGLM trigger guard the operator shall be capable of removing or opening the trigger guard without tools. Note: this parameter may be tested in an operational environment.

3.6.2.4 OPN APP 4, Speed of Target Engagement: The EGLM shall provide the operator with an improved capability over the current M203 with quadrant and leaf sight, and with the future Grenade Launcher Day/Night Sight Mount, to more rapidly engage targets with an increased hit probability from the prone, kneeling, sitting, and standing positions (supported and unsupported). Note: this parameter may be tested in an operational environment. Current firing rate standard of M203 is 5-7 rounds per minute.

3.6.2.5 OPN APP 5, Accuracy: At a range of 200 meters, the center of impact of a 20 round group shall be within a targeting circle with a diameter of 10 meters, using the 200 meter aiming point as the center. As an objective, the EGLM shall provide first round hit capability to the maximum range of the weapon (400 meters). Note: From 0-150 meters, first round hit is defined as the first round fired impacting on an E-type silhouette target. From 151-400 meters, first round hit is defined as the first round fired impacting within a 5-meter radius circle of the target.

Rationale: Modified M203 and Army M203 Enhanced Fire Control Device (MEFC) Specifications.

3.6.2.6 OPN APP 6, Night Vision Compatibility: The EGLM's sighting system shall allow focused target observation and viewer observation of the compensated aim-point when the operator uses standard issue Night Observation Devices (NODs) It is highly desired that the GLD/NSM be compatible with the following Night vision devices:

1) AN/PVS-7A, 2) AN/PVS-7B's 3) AN/PVS-7C, 4) AN/PVS-7D, 5) AN/PVS-14, 6) AN/PVS-15, 7) AN/PVS-18 and 8) AN/PVS-21's.

3.6.2.7 OPN APP 7, Range Finder Performance: (A performance measure will be established that allows the evaluation of probability of successful laser ranging (reflectivity) against typical SOF targets. Additionally this paragraph will define the "graceful degradation" requirement, wherein a sighting system that uses active laser range finding, if it fails electronically, will still have some ranging capability, through use of stadiametric or other optical approximation method).

3.6.2.8 OPN APP 8, Spill Light: In low light conditions, the EGLM will minimize light signature on the operator, EGLM, SOPMOD and rifle/carbine. This is an operator survivability requirement that may be tested in an operational environment.

3.6.2.9 OPN APP 9, Endurance: The EGLM shall withstand a minimum of 4000 rounds fired through each weapon without part failure degradation of performance. As an objective, the EGLM shall withstand 10000 rounds fired. Part failure is defined as the occurrence of broken or unserviceable part that renders the launcher inoperable or unsafe if firing is continued.

Rationale: Modified M203 Specification (MIL-L-45935A)

3.6.2.10 OPN APP 10, Zero Retention: EGLM with sighting system shall allow an operator to fire 288 rounds in 96 hours in an operational environment, while retaining zero. A shift in zero is defined as a shift of 5 meters at 200 meters.

Rationale: Modified MEFC Specification - Minimum basic load = 36 rounds. 288 rounds = 2 basic loads per mission for 4 missions.

3.6.2.11 OPN APP 11, Interoperability (3): EGLM shall safely fire the following ammunition types (DODIC in parentheses): 40mm Rubber Ball (BA08), Foam Rubber Baton (BA07), CS (BA05), Tactical CS M651 (B567), Riot Control CS M674 (B537), White Smoke Canopy XM680 (B477), Multiple Projectile XM576 (B534), Wooden Baton (BA09).

3.6.2.12 Power Source

The active power source (battery if required) shall be a commercially available battery equivalent to the Ba-3058/U 1.5 volt, AA size (NSN 6135-00-985-7845), the AA Lithium 3.9 volt size (Part Number 205129-006) and/or the DL 1/3 N 3Volt Battery (NSN 6135-01-398-5922). The EGLM sighting system must, if it's batteries or electronics fail, be usable in daylight, and in darkness with an external light source, such as a flashlight or chemical light. The power source and all electronics included in the EGLM shall not be susceptible to electromagnetic interference. The performance of the EGLM, when tested per MIL-STD-461 for RS02, shall not be degraded by electromagnetic interference.

3.6.3 Environmental APP Requirements:

3.6.3.1 ENV APP 1, Operating/storage temperatures: The EGLM shall exhibit neither damage nor degradation of performance when operated in a temperature environment of -46° to +49° C, stored (non-operating) in a temperature environment of -46° to +71° C, or when exposed to sudden temperature changes between -46° to +49° C inclusive.

3.6.3.2 ENV APP 2, Sand and Dust Environment: The EGLM shall exhibit neither damage nor degradation of performance when exposed to sand and dust in accordance with MIL-STD-801E, method 510.3, procedures I and II.

3.6.3.3 ENV APP 3, Vibration: The EGLM shall exhibit neither damage nor degradation of performance after vibration and rough handling typical of Special Forces missions. Actual operations may be included in testing, or test machines (e.g. cyclic load machines, etc.) may be used to simulate these environments. The weapon must function and show no significant shift in zero. A shift in zero is defined as a shift of 5 meters at 200 meters.

3.6.3.4 ENV APP 4, Drop: EGLM shall withstand shock (drop) testing, from 2 meters onto steel ¼" thickness, backed by concrete, individually in six (6) orientations (both ends and all four (4) sides) with no damage (other than cosmetic) or functional degradation.

3.6.3.5 ENV APP 5, Rough Handling: The EGLM shall exhibit neither damage nor degradation of performance when subjected to a loose cargo vibration test in accordance with MIL-STD 810E, Method 514.4. The weapon must show no significant shift in zero. A shift in zero is defined as a shift of 5 meters at 200 meters.

3.6.3.6 ENV APP 6, Moisture: The EGLM shall exhibit neither damage, leakage, intake of moisture, or degradation of performance resulting from being intermittently operated for not less than 10 consecutive days in a relative humidity from 59% to 88% and a temperature environment of +31° to +41° C inclusive, or when immersed for not less than two (2) hours under one (1) meter (3.3 feet) of water in a non-operating mode after being pre-cooled and stabilized at -45° C.

3.6.3.7 ENV APP 7, Corrosion Resistance: The ELGM shall not exhibit leakage, damage, significant corrosion or degradation of performance due to exposure to a salt fog atmosphere consisting of 5 ± 1 percent of salt solution for a minimum of 240 hours.

3.6.3.8 ENV APP 8, Altitude: The EGLM shall not exhibit leakage, damage, or degradation of performance when subjected to a pressure equivalent to 35,000 feet of altitude for a period of 2 hours.

3.6.3.9 ENV APP 9, The EGLM shall suffer no damage or degradation of performance when exposed to battlefield chemicals in accordance with MILSTD 810E.

3.6.3.10 ENV APP 10, Immersion: The EGLM shall not exhibit leakage, damage, or degradation of performance when subjected to immersion in water to a depth of 66 feet for 2 hours.

3.6.4 Maintenance and Logistic APP Requirements

3.6.4.1 LOG APP 1, Maintenance: The operator shall perform normally scheduled maintenance in less than 10 minutes for the EGLM. The Mean Time To Repair (MTTR) at the unit level for the EGLM shall not exceed 0.5 hours. The time to repair is defined as the total time required to restore the EGLM and mounts to operation, including diagnostic time. At Direct Support, the MTTR shall be one hour or less.

3.6.4.2 LOG APP 2, Interchangeability: The EGLM design and ILS programs shall conform to the guideline 7 of MIL-HDBK-454. The system design and ILS program shall ensure that the device assemblies, sub-assemblies and replacement parts physically and functionally interchange at the LRU level without modification of the fielded equipment. Sights, mounts, lens/dust covers and spare parts that are capable of being replaced without alteration, modification or hand fitting, shall be completely interchangeable without the use of special tools and without any degradation in performance.

3.6.5 Electromagnetic Radiation Operational (EMRO) APP Requirements

3.6.5.1 EMRO APP 5: While in operation, electromagnetic emissions from the EGLM shall not exceed the applicable limits of MIL-STD-461D, test method TBD (ground applications).

3.6.5.2 EMRO APP 4: The EGLM-system shall meet this performance specification when exposed to conducted emissions specified in MIL-STD-461D, test methods TBD.

3.6.5.3 EMRO APP 3: The EGLM-system shall meet its performance specifications and operate successfully while subjected to the electromagnetic field in Table 1 below.

Electromagnetic Radiation Hazard

<i>Frequency range MHz</i>	<i>E-field V/m, RMS</i>	<i>E-field V/m, Peak</i>	<i>Polarity V/H</i>
1 – 20	100	200	V
20 – 100	100	200	V + H
100 – 1 000	200	400	V + H

Electromagnetic Radiation Operational Parameters

<i>Frequency range MHz</i>	<i>E- field V/m</i>	<i>Modulation</i>	<i>Polarity V/H</i>
80 – 100	20	AM	V + H

3.6.5.4 EMRO APP Electromagnetic Pulse (EMP): The EGLM system shall function after being subjected to a electromagnetic pulse of _[TBD]___ in accordance with MIL-STD-461D, part TBD.

3.6.6 Pre-Planned Improvements, Upgrades and Product Growth APPs

3.6.6.1 Programmable Air-Burst (Objective): The EGLM design features shall accommodate the upgrading of the weapon to fire Programmable 40 x 46mm Ammunition deriving range information from the weapon fire-control. The EGLM Fire Control will provide for a ballistic solution for as required for future programmable ammunition.

3.6.6.2 The EGLM shall fire an upgraded generation of conventional munitions with improved accuracy and reduced dispersion when compared to the currently fielding munitions.

4. Other Notes:

Certain requirements are yet to be developed, to include Preparation for Delivery, Basic Issue Items, Standard Equipment List, Accessories and Optional Equipment, Service Documentation, Operator Manual, Maintenance Manual with Maintenance Allocation Chart.